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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,007	10/02/2003	James Guo	200312727-1	9248

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EXAMINER	
MARTINEZ, JOSEPH P	
ART UNIT	**PAPER NUMBER**
2873	

DATE MAILED: 09/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/678,007	GUO ET AL.	
	Examiner	**Art Unit**	
	Joseph P. Martinez	2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.
2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-43* is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1,2,4-7,9,10,15,16,19,22,24-29,32,35,37 and 39-43* is/are rejected.
7)☒ Claim(s) *3, 8, 11-14, 17, 18, 20, 21, 23 30, 31, 33, 34, 36 and 38* is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on *02 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a)☐ All b)☐ Some * c)☐ None of:
1.☐ Certified copies of the priority documents have been received.
2.☐ Certified copies of the priority documents have been received in Application No. _____.
3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10-2-03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4-7, 9, 10, 15, 16, 19, 22, 24-29, 32, 35, 37 and 39-43 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Meier et al. (6147790).

Re claims 1 and 16, Meier et al. teaches for example in fig. 4 and 6, a micro-mirror device or multiple micro-mirror devices formed in an array on a substrate (col. 3, ln. 31-33), comprising: a substrate (104); at least one address electrode (310) positioned over the substrate and configured to provide an electrostatic force (col. 7, ln. 50-62); at least one support member (116) positioned over the substrate and extending upward above the substrate (fig. 4); a mirror (302) disposed over the at least one address electrode and coupled (via 326) to the at least one support member, the mirror configured to deflect toward the substrate in response to the at least one address electrode applying the electrostatic force to a portion of the mirror (col. 7, ln. 50-62); and a spring member (328) spaced apart between the substrate and the mirror and coupled to the at least one support member (col. 9, ln. 24-32), the spring member being operable to deflect separately from the mirror and toward the substrate (col. 8, ln. 27-37, wherein the office interprets the mirror to be operable by electrostatic force and the spring ring to be operable by means of mechanical force, and therefore is operable to deflect separately).

Re claim 25, Meier et al. teaches for example in fig. 4 and 6, a method of increasing the switching frequency of a micro-mirror device (wherein the office interprets Meier et al. to disclose all of the features of the apparatus and therefore is capable of the functional limitation), the method comprising: applying a voltage to at least one address electrode (310) formed on a substrate (104) to provide an electrostatic force (col. 7, ln. 50-62) to a spring member (328) and a mirror (302) each spaced apart from each other and disposed above the at least one address electrode (fig. 4); deflecting a first spring portion of the spring member and a first mirror portion of the mirror, separate from each other (col. 8, ln. 27-37, wherein the office interprets the mirror to be operable by electrostatic force and the spring ring to be operable by means of mechanical force, and therefore is operable to deflect separately), toward the substrate in response to the electrostatic force of the at least one address electrode (col. 7, ln. 50-62); releasing the electrostatic force from the at least one address electrode (col. 8, ln. 31-42); and forcing the first mirror portion upward with the first spring portion in response to energy stored in the spring member (col. 8, ln. 31-42).

Re claim 35, Meier et al. teaches for example in fig. 4 and 6, a micro-minor device, comprising: a substrate (104); a mirror (302) positioned over the substrate and operatively coupled thereto (via 326) and configured to pivotably actuate toward the substrate between a first position and a second position (col. 7, ln. 50-62); and a spring member (328) operatively coupled to the substrate (via 116) and spaced apart between the substrate and the mirror (fig. 4), the spring member being operable to deflect separately from the mirror and toward the substrate (col. 8, ln. 27-37, wherein the office interprets the mirror to be operable by electrostatic force and the spring ring to be operable by means of mechanical force, and therefore is operable to deflect separately).

Re claim 41, Meier et al. teaches for example in fig. 4 and 6, a micro-mirror device, comprising: a substrate (104); a mirror (302) positioned over the substrate and operatively coupled thereto (via 326), the mirror operable to deflect to at least a first position and a second position (col. 7, ln. 50-62); spring means (328) for assisting in forcing the minor from at least one of the first position and the second position (col. 8, ln. 27-37); and deflecting means for deflecting the mirror and the spring means, separate from each other (col. 8, ln. 27-37, wherein the office interprets the mirror to be operable by electrostatic force and the spring ring to be operable by means of mechanical force, and therefore is operable to deflect separately), toward the substrate.

Re claim 2, Meier et al. further teaches for example in fig. 4 and 6, the spring member is operable to assist in forcing the mirror upward when the electrostatic force is released (col. 8, ln. 27-37).

Re claims 4, 22, 32 and 40, Meier et al. further teaches for example in fig. 4 and 6, the spring member is configured to increasingly store energy from a neutral position to a maximum deflected position (col. 8, ln. 31-33).

Re claim 5, Meier et al. further teaches for example in fig. 4 and 6, the mirror comprises first and second side portions with a central axis defined therebetween (col. 7, ln. 51-52), the mirror being operable to pivot about the central axis between a first and second position (col. 7, ln. 51-52) with the spring member configured to assist in pivoting the mirror to at least one of the first and second positions (col. 8, ln. 27-37).

Re claims 6, 7, 28 and 37, Meier et al. further teaches for example in fig. 4 and 6, the at least one electrode comprises first and second electrodes (310) disposed below the first and second side portions of the mirror (fig. 4) and configured to deflect at least the mirror to the first and second positions by alternating the electrostatic force applied through the respective first and second electrodes (col. 8, ln. 42-49) and the spring member is configured to store energy between a neutral position and a maximum deflected position (col. 8, ln. 31-33) and releases the stored energy to assist in alternately forcing the mirror upward to at least one of the first and second positions (col. 8, ln. 42-49).

Re claim 9, Meier et al. further teaches for example in fig. 4 and 6, the spring member comprises opposite first and second spring portions (330) extending outward below respective first and second side portions of the mirror.

Re claims 10 and 39, Meier et al. further teaches for example in fig. 4 and 6, the spring member is operable to assist in controlling a frequency of the mirror deflecting between a first position and a second position (col. 8, ln. 42-49).

Re claims 15 and 24, Meier et al. further teaches for example in fig. 4 and 6, wherein the substrate comprises logic circuitry formed therein configured to control the at least one address electrode (col. 5, ln. 21-23).

Re claim 19, Meier et al. further teaches for example in fig. 4 and 6, the spring member is operable to assist in forcing the mirror upward when the electrostatic force is released (col. 8, ln. 27-37).

Re claims 26 and 27, Meier et al. further teaches for example in fig. 4 and 6, the deflecting comprises deflecting (col. 8, ln. 25-30, via mechanical force from the mirror pushing down on the spring ring) the first spring portion of the spring member to a first position in contact with the substrate (col. 9, ln. 7-14) and the deflecting comprises deflecting the first mirror portion of the mirror to contact an upper surface of the first spring portion (col. 8, ln. 25-30) subsequent to the first spring portion contacting the substrate (col. 9, ln. 7-14).

Re claim 29, Meier et al. further teaches for example in fig. 4 and 6, the forcing comprises pivoting the first mirror portion upward so that the second mirror portion deflects downward toward a second position on the second side of the substrate (col. 8, ln. 42-79, wherein the office interprets "propelled" to include mechanical force from the spring as well as electrostatic force, as is well known in the art).

Re claims 42 and 43, Meier et al. further teaches for example in fig. 4 and 6, the deflecting means comprises at least an electrostatic force (col. 7, ln. 50-62).

Allowable Subject Matter

Claims 3, 8, 11-14, 17, 18, 20, 21, 23, 30, 31, 33, 34, 36 and 38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art taken alone or in combination fails to anticipate or fairly suggest the limitations of the claims, in such a manner that a rejection under 35 USC 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in dependent claims 3, 8, 11, 13, 14, 17, 20, 21, 23, 30, 33, 34, 36 and 38.

Specifically regarding claims 3, 8, 13, 14, 20, 21, 30, 33 and 36, Meier et al. (6147790) teaches the state of the art of micro-mirror devices.

But, Meier et al. (6147790) fails to explicitly teach the spring member is operable independently in response to electrostatic force, as claimed.

Specifically regarding claims 14, 23 and 38, Meier et al. (6147790) teaches the state of the art of micro-mirror devices.

But, Meier et al. (6147790) fails to explicitly teach the spring member comprises a piezoelectric element and is configured to deflect in response to the piezoelectric element, as claimed.

Specifically regarding claims 14, 23 and 38, Meier et al. (6147790) teaches the state of the art of micro-mirror devices.

But, Meier et al. (6147790) fails to explicitly teach a dielectric liquid configured to immerse at least the spring member and the mirror or the array of micro-mirrors, as claimed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph P. Martinez whose telephone number is 571-272-2335. The examiner can normally be reached on M-F 7:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y. Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JPM
9-9-04

Georgia Epps
Supervisory Patent Examiner
Technology Center 2800